



HELIOPHYSICS EXPLORERS PROGRAM ANNOUNCEMENT OF OPPORTUNITY (AO)

2022 SMALL EXPLORER (SMEX)

STEP 1 QUESTIONS & ANSWERS

**Updated
November 10, 2022**

~~October 25, 2022~~

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~~May 25, 2022~~

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2022 SMALL EXPLORER (SMEX)

STEP 1 QUESTIONS & ANSWERS

Please submit your Questions to Dr. Moses, Mr. Florance, and Dr. Wu by email at:

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We will work to develop Answers your Questions, and post those Answers to this document. Please check back for the latest version, as you may not be notified that your Question has been answered.

Q&As 1 and 2 posted on May 25, 2022.

Q&A 1 amended new target date for draft SMEX AO to 10 Jun 2022 on June 3, 2022.

Q&A 2 amended with Cis-Lunar Orbit option on July 26, 2022.

Q&As 3, 4, 5, 6, 7, 8, 9, and 10 posted on July 26, 2022.

Q&A 2 amended with updated information for Options B and C on August 5, 2022.

Q&A 1 amended with updated AO release and proposal due dates on August 23, 2022.

Q&A 2 amended with updated information for Option C on August 23, 2022.

Q&As 11, 12, 13, 14, and 15 posted on August 24, 2022.

Q&As 1 and 2 amended with updated information on August 30, 2022.

Q&A 2 amended with updated information on September 20, 2022.

Q&As 16 and 17 posted on September 20, 2022.

Q&As 18, 19, 20, 21, 22, 23, 24, and 25 posted on October 18, 2022.

Q&A 26 posted on October 25, 2022.

Q&As 27 and 28 posted on November 10, 2022.

Additions are in bold and/or *italicized* text and deletions are struck through in amendments.

Q1: The Community Announcement (released 22 December 2021) indicated that the target release dates for the draft and final SMEX AOs are March and June 2022, respectively. Does NASA have revised dates for the draft and final SMEX AO release?

A1: The target draft and final SMEX AO release dates are ~~3 10 June and 23 31 August~~ **9 September** 2022, respectively. The target due date for SMEX proposals is ~~21 November~~ **9 8 December** 2022. **[amended August 30, 2022]**

Q2: The Community Announcement (released 22 December 2021) indicated that the NASA-provided launch options under the SMEX AO would utilize Launch Services Program (LSP) Venture-Class Acquisition of Dedicated and Rideshare (VADR) Launch Services. Is additional guidance and information available on VADR options?

A2: Heliophysics 2022 SMEX AO selections will have payload risk classifications of Class D as defined in NPR 8705.4A. The VADR launch services are specifically tailored to provide the NPD 8610.7D risk and NPD 8610.23C technical oversight required for NASA Class D missions, and thus represent an appropriate cost to NASA for this SMEX opportunity. For the 2022 SMEX AO, the AO-Provided Launch Services options are projected to be as follows:

A Heliophysics Explorers investigation utilizing AO-Provided Launch Services will be launched on one or two launch vehicles (LVs) that NASA will provide as Government Furnished Equipment (GFE), utilizing either the Launch Services Program (LSP) Venture-Class Acquisition of Dedicated and Rideshare (VADR) Launch Services or Rideshare on Government Primary launches. Standard launch services utilizing a domestic launch vehicle certified as category 1, 2, or 3 per NPD 8610.7D, *NASA Launch Services Risk Mitigation Policy for NASA-Owned and/or NASA-Sponsored Payloads/Missions*, regardless of the payload classification, will be provided. There will typically be a charge against the PI-Managed Mission Cost for any launch services beyond the standard launch services offered. Applicable mission unique costs specifically identified in this AO or documents posted to the Program Library must be reflected as reductions to the Adjusted AO Cost Cap.

The *Launch Services Program Information Summary* describes categories of AO-Provided Launch Services being offered at no cost. The following table provides an overview of the performance options.

<i>SMEX Launch Option Summary</i>	Representative Orbit	<i>Maximum Mass to Representative Orbit</i>
1 or 2 × Option A	500 km Sun-Synchronous*	1 or 2 × 300 kg
1 × Option B	500 km Sun-Synchronous*	1 × 960 910 kg
1 or 2 × ESPA or 1 or 2 × ESPA Grande Port (<i>Option C</i>)	Low Earth Orbit, Geosynchronous Transfer Orbit or Cis-Lunar Space	1 or 2 × 220 kg per ESPA Port or 1 or 2 × 465 kg per ESPA Grande Port
1 × Option A and 1 × Option C	As per Option	As per Option

* For other orbits, refer to the *Launch Services Program Information Summary*

An ~~incentive~~ **reimbursement** of up to \$6M (Fiscal Year 2022), covering the proposed cost, is offered as an increase to the AO Cost Cap for missions utilizing Option A or B **or C** that require a PI-provided propulsive stage **or a propulsion system augmentation (e.g., tank size or thrusters) necessary to achieve insertion or phasing into a target orbit** ~~and have an operational semi-minor axis of at least two (2) R_E~~. **[amended August 30, 2022]**

Missions will not be responsible for any costs that exceed those listed in this AO or the *Launch Services Program Information Summary* in the Program Library, or the impact to the mission of any launch delay caused by AO-provided access to space.

The *Launch Services Program Information Summary* ~~will be~~ **was** posted to the Program Library ~~before the release of~~ **along with** the final 2022 SMEX AO **in September 2022**. While the volume for Option A is projected to be similar to that offered for the 2016 SMEX AO, the volume for Option B is projected to approximately 70” in diameter × 100” in length. **[amended September 20, 2022]**

The table above is amended to specify that 1 or 2 ESPA ports, or 1 or 2 ESPA Grande ports are available under Option C. The table above is further amended to allow a combination of 1 Option A and 1 Option C. [amended August 23, 2022]

In the table above, Option A provides 1 or 2 launches of up to 300 kg to the equivalent of a 500 km Sun-Synchronous orbit. Option B provides 1 launch of up to 910 kg to the equivalent of a 500 km Sun-Synchronous orbit. Option C provides 1 or 2 ESPA Ports of up to 220 kg each, or 1 or 2 ESPA Grande Ports of up to 465 kg each, to the equivalent of the Representative Orbits listed. The combined Option of A and C provides 1 launch of up to 300 kg to the equivalent of a 500 km Sun-Synchronous orbit, as well as 1 ESPA Port of up to 220 kg, or 1 ESPA Grande Port of up to 465 kg, to the equivalent of the Representative Orbits listed above. [amended August 30, 2022]

Q3: Can 2022 SMEX AO proposals launch on a combination of one Option A launch to 500 km Sun-Synchronous Orbit and one Option C ESPA or ESPA Grande rideshare to Geosynchronous Transfer Orbit (GTO) or Cis-Lunar Space (CLS)?

A3: Yes, 2022 SMEX AO proposals may launch on a combination of one Option A launch to 500 km Sun-Synchronous Orbit and one Option C ESPA or ESPA Grande rideshare to GTO or CLS.

Q4: The 2022 SMEX AO appears to ask for less information than previous Heliophysics Explorers AOs and allocates less pages to some sections. Why is this 2022 SMEX AO different?

A4: To reduce the workload on investigation teams generating Pre-Phase A proposals, the NASA Science Mission Directorate (SMD) has developed the 2022 SMEX AO with several requirements deferred to Step 2 (see Section 1.1 of the 2022 SMEX AO) and other requirements simplified. For instance, simplified requirements can be found for management (e.g., 2022 SMEX AO Section 5.2.2, 5.3.4, 5.3.6 and Appendix B, Section G), systems engineering (e.g., 2022 SMEX AO Section 5.2.2 and Appendix B, Section F.3), schedule (Appendix B, p. B-2 and Section F.6), Letters of Commitment (Section 5.8.1 and Appendix B, Section J.2; see Q&A 5 below), and the heritage appendix (in the form of a table only; Appendix B, p. B-3 and Section J.12).

The page allocations have been reduced to reflect these requirement deferrals and simplifications. These page reductions takes into account the recent change in format to 5.5 lines per vertical inch as stated in Requirement B-3 of Appendix B of the 2022 SMEX AO.

The requirement deferrals and simplifications and the page reduction are expected to reduce the workload on proposing teams. Evaluators of proposals submitted to this 2022 SMEX AO will be trained and instructed to perform the evaluation based on these requirement deferrals and simplifications and the page reductions.

Q5: The Draft 2022 Heliophysics SMEX AO Section 5.8.1 requires Institutional Letters of Commitment from organizations offering contributions and from major partners; however, the Appendix B, Section J.2 of the same AO requires Institutional Letters of Commitment from organizations only offering contributions. Please clarify.

A5: The Draft 2022 Heliophysics SMEX AO Appendix B, Section J.2 has the appropriate language. Institutional letters of commitment must be provided only for organizations offering contributions of goods and/or services on a no-exchange-of-funds basis. Requirement 87 will be deferred to Step 2; the final AO will be updated to reflect this change.

Q6: In previous Heliophysics Explorers AOs, advisory services were offered by LSP for PI-provided access to space for a \$2M fee. What are advisory services are planned for the 2022 SMEX AO?

A6: The 2022 SMEX AO states, “The proposal shall describe the *arrangement between the PI and the launch service provider* (n.b., emphasis added) to enable the PI’s insight for launch services, consistent with NASA Procedural Documents (NPD) 8610.7D and insight and approval consistent with NPD 8610.23C.” NASA Launch Services Program will not offer advisory services (documented in the *LSP Advisory Services Plan*) for PI-provided access to space in the 2022 SMEX AO. Please contact the LSP POC in the *Launch Services Program Information Summary* for more information.

Q7: After deploying the primary payload, can the launch vehicle perform an additional, dedicated delta-V maneuver(s) prior to deployment of a proposed secondary payload?

A7: No, this option is not offered for the 2022 SMEX AO.

Q8: Is an NLS-II procurement an option for launch services for the 2022 SMEX AO?

A8: No, launch services for the 2022 SMEX AO must be a VADR launch procurement.

Q9: The 2022 SMEX AO Requirement 35 states that DSN costs are not excluded and “shall be represented as a reduction to the AO Cost Cap”. Why is NASA charging proposers for this capability?

A9: NSN and DSN costs are represented as reductions to the AO Cost Cap for the 2022 SMEX AO to better capture the full costs to NASA SMD for each proposed mission. Cost estimation algorithms for the NSN and DSN and persons to contact to obtain costs for other networks and various Government-operated facilities are contained in the *SCaN MOCS* document or at the Interplanetary Network Directorate’s Commitment Office website at <https://deepspace.jpl.nasa.gov/about/commitments-office/>.

Q10: Mitigation plans for contributions require encumbrance of cost reserves. Are these encumbered cost reserves required regardless of their risk?

A10: Yes; Requirement 78 states, “For contributions that are essential to the success of the proposed investigation or in the critical path, the proposal shall include mitigation plans for the failure of non-U.S. funding or contributions to materialize...” The AO further states, “Mitigation may include ... holding reserves to develop the contribution directly. Note that reserves held for this purpose should be weighted by likelihood and will be considered by NASA to be encumbered.”

Q11: Requirement B-49 of the 2022 Heliophysics SMEX AO seems to imply that proposers need to provide exhaustive Basis Of Estimate (BOE) data as described in the examples (analogous cost, parametric) at each WBS level (down to subsystem and individual instrument elements). Is this the implication?

A11: No. Although the BOE requirement language has changed from previous AOs, the expectation remains for the BOE data to be appropriate for a Pre-Phase A mission. The requirement states that the BOE table must be clearly traceable to the WBS of Table B3. The examples present methods for systems and subsystems estimates that proposers may use to generate the BOE and the data associated with each method that must be provided within the BOE table in the proposal to support the proposed cost.

Q12: Can NASA provide insight into how mission proposals with multiple spacecraft will be assessed during Steps 1 and 2?

A12: Projects proposing multiple spacecraft are expected to show how the proposed mission architecture affects risk to mission success. Additional guidance for Steps 1 and 2 on how projects with multiple spacecraft can meet this expectation is available in the Program Library in *Guidance for Distributed Satellite System (DSS) Architectures for Class D Missions*.

Q13: The Q&A 2 posted on 25 May 2022 includes example dimensions for payload envelopes. What is the process for requesting additional information on launch vehicle performance, envelopes, and requirements, specifically GTO inclination, perigee and apogee altitudes?

A13: Information on launch vehicle performance, envelopes, and requirements is available in the *LSP Information Summary* in the Program Library. GTO opportunities are only offered as rideshares, and details may not be determined by the SMEX missions' parameters. SMEX mission parameters in Steps 1 and 2 must be adaptable to future primary mission parameters.

Additional information may be obtained by contacting Chuck Tatro, the LSP point of contact, at:

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Kennedy Space Center, FL 32899
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Q14: Are additional ESPA or ESPA Grande ports available under Option C, at a reduction to the AO Cost Cap?

A14: Additional ESPA or ESPA Grande ports are not available under Option C. However, PI-provided access to space (see Section 5.9.3) does allow purchase of more than 2 ports. Combinations of AO-provided and PI-provided access to space are not allowed.

Q15: Do the PI-provided propulsive stages qualify for extra pages in Section F, due to being additional flight elements?

A15: No.

Q16: When will the *Launch Services Program Information Summary* be posted to the Program Library?

A16: The *Launch Services Program Information Summary* was posted to the Program Library along with the final 2022 SMEX AO in September 2022.

Q17: What is LSP's expected schedule for delivery of a test-correlated model relative to the launch date?

A17: Under the VADR launch services contract, the Launch Service provider is required to perform 2 CLA analyses, a Prelim and Final. The Prelim is due 3 months after receipt of the initial (generally non test correlated) Spacecraft model, and the final CLA is due by L-6 months. So LSP would expect the final (test correlated model) to be provided by the Spacecraft contractor at around L-8 or 9 months to sanity-check it before it is provided to the Launch Service contractor so they can complete the analysis by L-6 months.

Q18: At the preproposal conference, it was stated that missions utilizing VADR launch services could be either on a dedicated launch service or rideshare launch service. Does this mean that AO-provided launch Options A and B could be realized as rideshares?

A18: Yes, in preparation to support a VADR launch services task order, a launch services interface requirements document (LSIRD) is developed by the spacecraft team and submitted to LSP. All qualified VADR launch services providers can bid for the launch services opportunity if they can meet your requirements. If a rideshare provider can meet your launch requirements for Option A or B, then they can propose an equivalent rideshare solution for your launch opportunity. It is encouraged by the NASA Heliophysics Division (HPD) that the design of the spacecraft is flexible enough to accommodate dedicated launch or rideshare options. This increases the flight opportunities for the payloads which may be a consideration during selection and down-selection.

Q19: The NASA Rideshare Users Guide (RUG) in the SMEX Program Library provides the option of a 56-inch radial volume for ESPA Grande (which corresponds to a 5m LV fairing). That isn't shown in the charts presented at the preproposal conference. Is the 56-inch volume still an option?

A19: Yes, 56" is only applicable to X dimension per note 1 in Table 6.1. The LSP presented charts will be updated to include note 1.

Table 6.1 ESPA/SPA RPL Mass, Volume Interface Requirements for 4-meter Fairing

ESPA/SPA	Port Mass Capacity ⁽⁴⁾	Allowable RPL Volume ^(1, 2, 3, 5)	RPL Interface
ESPA Grande 4 Port	465 kg	42"x46"x38" Y, Z, X	24" circular
ESPA 6 Port	220 kg	24"x28"x38" Y,Z,X	15" circular

(1) X-dimension assumes a 4-meter fairing; ESPA Grande on 5-meter fairing allows 56"
 (2) The RPL X-axis starts at the ESPA/SPA port interface plane.
 (3) The RPL X-axis dimension includes the separation system width. This means separation system width will be subtracted from the 38" allowable dimension.
 (4) The flyaway portion of the separation system shall be considered as part of the RPL total mass.
 (5) Separation system tip-off must be accounted for to ensure any RPL structure that extends into the internal volume of the ring will exit the volume upon RPL deployment without contacting the port inner diameter.

Q20: Is there a formal definition for GTO deployment?

A20: No, you can assume a typical GTO apogee of 42,000 km, but the inclination is unknown until an available launch is identified. The expectation is that there will be GTO launch opportunities every couple of years. It is important that you provide the requested information for up to two years of storage, which was called out in the SMEX AO.

Q21: Option C is listed on page 56 in the SMEX AO, but not in Attachment 1 of the *Launch Services Program Information Summary*, where only Option A and Option B information are provided. Is Option C still available?

A21: Yes, Option C is available. The NASA Rideshare Users Guide (RUG) in the SMEX Program Library provides information on Option C.

Q22: In Attachment 1 of the *Launch Services Program Information Summary*, what does “Guidance reserves have been allocated to account for 3-sigma flight performance” mean? Is the LV or the spacecraft responsible for correcting 3-sigma LV dispersions?

A22: Missions under VADR will be no different from other means of flight such as NLS II or even commercial mission. Following the NLS II approach, it will be the responsibility of the spacecraft to accommodate the 3-sigma flight performance of the launch provider delivered orbital box.

Q23: In Option C on page 56 in the SMEX AO, with multiple rideshare spacecraft, what orbit will the LV drop off a single NASA SMEX spacecraft? What if a SMEX proposal has two spacecraft with different LTDNs?

A23: The expectation is that the secondary payload will be dropped off in the same inclination and LTDN as the primary payload as part of option C. It is the responsibility of the spacecraft to carry enough propulsive capability to move one of the spacecraft to a different LTDN. A requirement for different LTDNs could lead to separate launches.

Q24: There are apparent discrepancies between deferred requirements in the body of the SMEX AO and Requirement B-37. Requirements 38 and 41 are deferred but the information seems to be still required by Requirement B-37. Do the requirements in the main body of the AO take precedence over the Appendix B requirements?

A24: Yes, the main body requirements take precedence over the Appendix B requirements. Thus, any items common to Requirements B-37, 38, and/or 41 are superseded by Requirements 38 and 41 and should be deferred until Step 2. However, items in Requirement B-37 not included in Requirements 38 and 41 should be addressed in the Step-1 proposal.

Q25: The table on non-U.S. participation in Requirement 85 of the Helio SMEX AO was provided in Appendix J.4 in previous Heliophysics AOs. Appendix J.4 has been deleted in this AO. Where should proposers put the table for Requirement 85 in their proposal?

A25: Proposers should put the table from Requirement 85 in Appendix J.5. The table of non-U.S. participation will not count against the page limit for Appendix J.5.

Q26: The final 2022 Heliophysics SMEX AO states that Requirement 88 is deferred to Step 2. However, the Appendix F compliance checklist lists Requirement 88 as part of the Step 1 submission. Is Requirement 88 deferred to Step 2?

A26: Requirement 88 is deferred to Step 2 and will not be considered during compliance checks for this solicitation.

Q27: Are proposers required to submit a lobbying certification and SF424 via Grants.gov?

A27: At the end of Step 1, if a proposal is selected for a concept study in Step 2, proposers will negotiate the funding vehicle (e.g., contract, grant, cooperative agreement, etc.) for the concept study with the Explorers Program Office. Grant awards greater than \$100K require a certification of compliance with a national policy mandate concerning lobbying to be submitted prior to award.

Q28: Are proposers required to prepare and submit a Small Business Subcontracting Plan at the time of Step-1 selection?

A28: At the end of Step 1, if a proposal is selected for a concept study in Step 2, proposers other than small business concerns are required to prepare and submit a Small Business Subcontracting Plan as part of the Concept Study Report. These plans will be evaluated in Step 2 as Criterion E, *Quality of Plans for Small Business Subcontracting Plans*.